

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 8850 WO GI-RIX	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/EP2004/011031	International filing date (<i>day/month/year</i>) 02.10.2004	Priority date (<i>day/month/year</i>) 30.10.2003	
International Patent Classification (IPC) or national classification and IPC F16H3/66, F16D25/10, F16H63/30			
Applicant ZF FRIEDRICHSHAFEN AG			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 13 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/011031

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

 - international search (Rule 12.3 and 23.1(b))
 - publication of the international application (Rule 12.4)
 - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished
 the description:
 pages 1-61 _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____
 the claims:
 nos. _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
 nos.* 1-52 received by this Authority on 23.09.2005 with letter of 21.09.2005
 nos.* _____ received by this Authority on _____
 the drawings:
 sheets 1/11-11/11 _____ as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____
 a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.	PCT/EP2004/011031
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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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1. Statement

Novelty (N)	Claims	1–52	YES
	Claims	_____	NO
Inventive step (IS)	Claims	1–52	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	1–52	YES
	Claims	_____	NO

2. Citations and explanations (Rule 70.7)

1. The present report makes reference to the following documents:

D1: EP 1 265 006 A (GENERAL MOTORS CORPORATION)

11 December 2002 (2002-12-11)

D2: DE 199 12 480 A1 (ZF FRIEDRICHSHAFEN AG)

28 September 2000 (2000-09-28).

2. INDEPENDENT CLAIM 1

2.1 Document D2 is considered to be the prior art closest to the subject matter of claim 1. Said document discloses (the references in parentheses are to document D2, see figure 3):

a multistep automatic transmission with a drive shaft (10), an output shaft (11), at least three single planetary gear sets (2, 3, 4), and at least five shift elements (5–9), wherein:

- the three planetary gear sets (2, 3, 4) are mutually coaxial;
- the second and third planetary gear sets (3, 4) are mutually adjacent in an axial direction;

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/011031Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- a sun gear (20) of the third planetary gear set (4) can be attached to the transmission housing of the multistep automatic transmission via the first shift element (7);
- the drive shaft (10) is connected to a sun gear (16) of the second planetary gear set (3);
- the drive shaft (10) can be connected via the second shift element (8) to a sun gear (12) of the first planetary gear set (2) and/or via the fifth shift element (9) with a spider (15) of the first planetary gear set (2);
- alternatively, the sun gear (12) of the first planetary gear set (2) can be attached to the transmission housing via the third shift element (5) and/or the spider (15) of the first planetary gear set (2) can be attached to the transmission housing via the fourth shift element (6); and
- the output shaft (11) and an internal gear (14) of the first planetary set (2) and a spider of the third planetary gear set (4) are interconnected and a spider (19) of the second planetary gear set (3) is connected to an internal gear (22) of the third planetary gear set (4) and the spider (15) of the first planetary gear set (2) is connected to an internal gear (18) of the second planetary gear set (3); and

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITYInternational application No.
PCT/EP2004/011031**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- only one shaft (10) passes centrically in an axial direction right through the second planetary gear set (3); and
- the first shift element (7) is in the form of a multi-disk brake.

Thus, the subject matter of claim 1 differs from the known automatic transmission in that:

- a) the second and fifth shift element, viewed in a three-dimensional manner, are axially arranged between the first and second planetary gear sets; and
- b) the fourth shift element, viewed in a three-dimensional manner, is in a region radially above the planetary gear sets.

The subject matter of claim 1 is therefore novel (PCT Article 33(2)).

2.2 The problem addressed by the present invention can consequently be regarded as that of configuring the known transmission in a more compact manner.

The solution to the above problem, as proposed in claim 1 of the present application, involves an inventive step (PCT Article 33(3)). The reasons are as follows:

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITYInternational application No.
PCT/EP2004/011031**Box No. V** **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

although document D1 (see figure 1) discloses a similar transmission, in which the corresponding second and fifth shift elements (50 and 52) are between the first and the second planetary gear set (30 and 40), said transmission does not have two features of the preamble of claim 1 and feature b) is not disclosed in document D1. Neither D1 nor D2 contains anything to suggest this feature which, furthermore, contributes to the compact design of the transmission.

2.3 Claims 2 to 52 are dependent on claim 1 and, in consequence, likewise satisfy the requirements of the PCT in respect of novelty and inventive step.